This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): An image processing apparatus for generating graphics data representing a single seamless planar image synthesized from ~~a multiple~~ multiple sets of graphics data contained in a plurality of graphics files, in response to the plurality of graphics files each of which contains the graphics data composed of a multiplicity of planar pixels arrayed in a plane for representing a planar image, the image processing apparatus comprising:

a synthesis area establisher configured to establish a spheroidal projection plane centered on a predetermined point, as an area for synthesis of the multiple sets of graphics data;

a spheroidal image generator configured to generate a plurality of spheroidal images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane;

a feature point extractor configured to extract a feature point which ~~is an area having a predetermined characteristic~~ represents an external characteristic of a subject in an image, from each of the plurality of spheroidal images before overlapping the spheroidal images;

a correspondence relationship determiner configured to determine a correspondence relationship of the extracted feature points, between the plurality of spheroidal images;

a spheroidal image synthesizer configured to generate seamless spheroidal graphics data representing a single seamless spheroidal image, by synthesizing a plurality of graphics data each of which representing each of the spheroidal images, with reference to the determined correspondence relationship in a three-dimensional space; and

a planar image generator configured to generate the graphics data representing the single seamless planar image, from the seamless spheroidal image graphics data,

wherein each of the synthesis area establisher, the spheroidal image generator, the feature point extractor, the correspondence relationship determiner, the spheroidal image synthesizer, and the planar image generator is executed by ~~an integrated circuit~~ a processor.

Claim 2 (Currently Amended): The image processing apparatus in accordance with claim 1, wherein

the plurality of graphics files further include image attribute information which is attribute information of the graphics data, wherein

the image processing apparatus further comprises a focal distance determiner configured to determine a focal distance of an optical system used to generate the multiple sets of graphics data for each of the multiple set of graphics data, in response to the image attribute information, the focal distance determiner being executed by ~~an integrated circuit~~ a processor; and

the spheroidal image generator generates the plurality of spheroidal images by projecting each planar image represented by each of the multiple sets of graphics data onto the projection plane, the each planar images being placed at a location away from the predetermined point to the projection plane side, by the focal distance corresponding to each of the multiple sets of graphics data.

Claim 3 (Previously Presented): The image processing apparatus in accordance with claim 2, wherein

the image attribute information includes lens focal distance representing focal distance of a shooting lens; focal plane resolution unit specifying an unit of resolution in a focal plane of the optical system; focal plane height resolution representing a pixel count in a pixel height direction per the focal plane resolution unit; and focal plane width resolution representing a pixel count in a pixel width direction per the focal plane resolution unit;

the focal distance determiner determines the lens focal distance to be the focal distance; and

the spheroidal image generator determines a pixel size in a width direction by means of dividing the focal plane resolution unit by focal plane width resolution, and also determines a pixel size in a height direction by means of dividing the focal plane resolution unit by the focal plane height resolution.

Claim 4 (Previously Presented): The image processing apparatus in accordance with claim 2, wherein

the image attribute information includes 35 mm-equivalent lens focal distance which is a value of focal distance converted to a 35 mm film camera basis;

the focal distance determiner determines the 35 mm-equivalent lens focal distance to be the focal distance; and

the spheroidal image generator determines 35 mm film size as a size of the planar image.

Claim 5 (Previously Presented): The image processing apparatus in accordance with claim 2, wherein

the image attribute information includes focal plane resolution unit specifying an unit of resolution in a focal plane of the optical system; focal plane height resolution representing a pixel count in a pixel height direction per the focal plane resolution unit; and focal plane width resolution representing a pixel count in a pixel width direction per the focal plane resolution unit;

the spheroidal image generator comprises:

a spheroidal pixel establisher configured to establish spheroidal pixels on the spheroidal projection plane, the spheroidal pixel being allocated in a height direction by an angle divided by a largest one of the determined focal distances and the focal plane height resolution, and also being allocated in a width direction by an angle divided by the largest determined focal distance and the focal plane width resolution; and

a spheroidal pixel value determiner configured to determine each pixel value for each of the spheroidal pixels, according to a pixel value of a planar pixel projected onto each of the spheroidal pixels.

Claim 6 (Currently Amended): An image processing apparatus for generating graphics data representing a single seamless planar image synthesized from ~~a multiple~~ multiple sets of graphics data contained in a plurality of graphics files, in response to the plurality of graphics files each of which contains the graphics data composed of a multiplicity of planar pixels arrayed in a plane for representing a planar image, the image processing apparatus comprising:

a synthesis area establisher configured to establish a cylindrical projection plane centered on a predetermined axis, as an area for synthesis of the multiple sets of graphics data;

a cylindrical image generator configured to generate a plurality of cylindrical images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane;

a feature point extractor configured to extract a feature point which ~~is an area having a predetermined characteristic~~ represents an external characteristic of a subject in an image, from each of the plurality of cylindrical images before overlapping the cylindrical images;

a correspondence relationship determiner configured to determine a correspondence relationship of the extracted feature points, between the plurality of cylindrical images;

a cylindrical image synthesizer configured to generate seamless cylindrical graphics data representing a single seamless cylindrical image, by synthesizing a plurality of graphics data each of which representing each of the cylindrical images, with reference to the determined correspondence relationship in a three-dimensional space; and

a planar image generator configured to generate the graphics data representing the single seamless planar image, from the seamless cylindrical image graphics data,

wherein each of the synthesis area establisher, the cylindrical image generator, the feature point extractor, the correspondence relationship determiner, the cylindrical image synthesizer, and the planar image generator is executed by ~~an integrated circuit~~ a processor.

Claim 7 (Currently Amended): The image processing apparatus in accordance with claim 6, wherein

the plurality of graphics files further include image attribute information which is attribute information of the graphics data, wherein

the image processing apparatus further comprises a focal distance determiner configured to determine a focal distance of an optical system used to generate the multiple sets of graphics data for each of the multiple set of graphics data, in response to the image attribute information, the focal distance determiner being executed by ~~an integrated circuit~~ a processor; and

the cylindrical image generator generates the plurality of cylindrical images by projecting each planar image represented by each of the multiple sets of graphics data onto the projection plane, the each planar images being placed at a location away from the predetermined axis to the projection plane side, by the focal distance corresponding to each of the multiple sets of graphics data.

Claim 8 (Previously Presented): The image processing apparatus in accordance with claim 6, wherein

the cylindrical image generator establishes the axis parallel to the height direction established in the graphics data.

Claim 9 (Previously Presented): The image processing apparatus in accordance with claim 7, wherein

the image attribute information includes lens focal distance representing focal distance of a shooting lens; focal plane resolution unit specifying an unit of resolution in a focal plane of the optical system; focal plane height resolution representing a pixel count in a pixel height direction per the focal plane resolution unit; and focal plane width resolution representing a pixel count in a pixel width direction per the focal plane resolution unit;

the focal distance determiner determines the lens focal distance to be the focal distance; and

the cylindrical image generator determines a pixel size in a width direction by means of dividing the focal plane resolution unit by focal plane width resolution, and also determines a pixel size in a height direction by means of dividing the focal plane resolution unit by the focal plane height resolution.

Claim 10 (Previously Presented): The image processing apparatus in accordance with claim 7, wherein

the image attribute information includes 35 mm-equivalent lens focal distance which is a value of focal distance converted to a 35 mm film camera basis;

the focal distance determiner determines the 35 mm-equivalent lens focal distance to be the focal distance; and

the cylindrical image generator determines 35 mm film size as a size of the planar image.

Claim 11 (Previously Presented): The image processing apparatus in accordance with claim 7, wherein

the image attribute information includes focal plane resolution unit specifying an unit of resolution in a focal plane of the optical system; focal plane height resolution representing a pixel count in a pixel height direction per the focal plane resolution unit; and focal plane width resolution representing a pixel count in a pixel width direction per the focal plane resolution unit;

the cylindrical image generator comprises:

a cylindrical pixel establisher configured to establish cylindrical pixels on the cylindrical projection plane, the cylindrical pixel being allocated in a height direction by an angle divided by a largest one of the determined focal distances and the focal plane height resolution, and being allocated in a width direction by an angle divided by the largest determined focal distance and the focal plane width resolution; and

a cylindrical pixel value determiner configured to determine each pixel value for each of the cylindrical pixels, according to a pixel value of a planar pixel projected onto each of the cylindrical pixels.

Claim 12 (Currently Amended): An image processing method of generating graphics data representing a single seamless planar image synthesized from a multiple sets of graphics data contained in a plurality of graphics files, in response to the plurality of graphics files each of which contains the graphics data composed of a multiplicity of planar pixels arrayed in a plane for representing a planar image, the image processing method comprising the steps of:

(a) establishing a spheroidal projection plane centered on a predetermined point, as an area for synthesis of the multiple sets of graphics data;

(b) generating a plurality of spheroidal images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane;

(c) extracting a feature point which is an area having a predetermined characteristic, from each of the plurality of spheroidal images;

(d) determining a correspondence relationship of the extracted feature points, between the plurality of spheroidal images;

(e) generating seamless spheroidal graphics data representing a single seamless spheroidal image, by synthesizing a plurality of graphics data each of which representing each of the spheroidal images, with reference to the determined correspondence relationship;

(f) generating the graphics data representing the single seamless planar image, from the seamless spheroidal image graphics data; and

(g) outputting the graphics data representing the single seamless planar image to a device selected from the group consisting of a printing device, a display device, and a storage device,

wherein each of steps (a) to (g) in the image processing method is executed by ~~an integrated circuit~~ a processor.

Claim 13 (Currently Amended): An image processing method of generating graphics data representing a single seamless planar image synthesized from a multiple sets of graphics data contained in a plurality of graphics files, in response to the plurality of graphics files each of which contains the graphics data composed of a multiplicity of planar pixels arrayed in a plane for representing a planar image, the image processing method comprising the steps of:

(a) establishing a cylindrical projection plane centered on a predetermined axis, as an area for synthesis of the multiple sets of graphics data;

(b) generating a plurality of cylindrical images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane;

(c) extracting a feature point which is an area having a predetermined characteristic, from each of the plurality of cylindrical images;

(d) determining a correspondence relationship of the extracted feature points, between the plurality of cylindrical images;

(e) generating seamless cylindrical graphics data representing a single seamless cylindrical image, by synthesizing a plurality of graphics data each of which representing each of the cylindrical images, with reference to the determined correspondence relationship;

(f) generating the graphics data representing the single seamless planar image, from the seamless cylindrical image graphics data; and

(g) outputting the graphics data representing the single seamless planar image to a device selected from the group consisting of a printing device, a display device, and a storage device,

wherein each of steps (a) to (g) in the image processing method is executed by ~~an integrated circuit~~ a processor.

Claim 14 (Currently Amended): A computer program product for causing a computer to generate graphics data representing a single seamless planar image synthesized from a multiple sets of graphics data contained in a plurality of graphics files, in response to the plurality of graphics files each of which contains the graphics data composed of a multiplicity of planar pixels arrayed in a plane for representing a planar image, the computer program product comprising:

a tangible computer readable storage medium; and

a computer program stored on the tangible computer readable storage medium, the computer program comprising:

a first program for causing the computer to establish a spheroidal projection plane centered on a predetermined point, as an area for synthesis of the multiple sets of graphics data;

a second program for causing the computer to generate a plurality of spheroidal images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane;

a third program for causing the computer to extract a feature point which is an area having a predetermined characteristic, from each of the plurality of spheroidal images;

a fourth program for causing the computer to determine a correspondence relationship of the extracted feature points, between the plurality of spheroidal images;

a fifth program for causing the computer to generate seamless spheroidal graphics data representing a single seamless spheroidal image, by synthesizing a plurality of graphics data each of which representing each of the spheroidal images, with reference to the determined correspondence relationship; and

a sixth program for causing the computer to generate the graphics data representing the single seamless planar image, from the seamless spheroidal image graphics data.

Claim 15 (Currently Amended): A computer program product for causing a computer to generate graphics data representing a single seamless planar image synthesized from a multiple sets of graphics data contained in a plurality of graphics files, in response to the plurality of graphics files each of which contains the graphics data composed of a multiplicity of planar pixels arrayed in a plane for representing a planar image, the computer program product comprising:

a tangible computer readable storage medium; and

a computer program stored on the tangible computer readable storage medium, the computer program comprising:

a first program for causing the computer to establish a cylindrical projection plane centered on a predetermined axis, as an area for synthesis of the multiple sets of graphics data;

a second program for causing the computer to generate a plurality of cylindrical images, by projecting each of planar images represented by each of the multiple sets of graphics data onto the projection plane;

a third program for causing the computer to extract a feature point which is an area having a predetermined characteristic, from each of the plurality of cylindrical images;

a fourth program for causing the computer to determine a correspondence relationship of the extracted feature points, between the plurality of cylindrical images;

a fifth program for causing the computer to generate seamless cylindrical graphics data representing a single seamless cylindrical image, by synthesizing a plurality of graphics data each of which representing each of the cylindrical images, with reference to the determined correspondence relationship; and

a sixth program for causing the computer to generate the graphics data representing the single seamless planar image, from the seamless cylindrical image graphics data.